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(54) Title: MESSAGE STORAGE AND DELIVERY SYSTEM

(57) Abstract

A Message Storage and Deliver System (MSDS) (10) is connected to a plurality of DID phone lines and receives facsimile messages, voice messages, and data messages. The messages are stored in memory and are also converted into appropriate hyper-test mark-up language (HTML) (30) files. The users can then connect to the MSDS (10) through the Internet (30). The users of the MSDS (10) therefore have the advantage of being able to receive their messages at any time and at any location at a reasonable cost. The user can also telephone the MSDS (10) to listen to messages or to alter the service provided by the MSDS (10).

    With a fifth option, a full size image of each page is
transmitted to the user's computer 32. The user can scroll
through the pages of the facsimile message and easily read the
contents of each page. If the user wants the message

5   downloaded to the computer 32, the user selects the message
and the HTTPD within the MSDS 10 transmits the message to the
user's computer 32 through the Internet 30.

    As discussed above, after the database is updated at step
54, the MSDS 10 will generate additional information based

10 upon the option selected for displaying the facsimile
messages. More specifically, as shown in Fig. 4(A), if the
first option has been selected, as determined at step 100,
then at step 102 the MSDS 10 will generate the textual listing
of the facsimile messages with anchors or references to the

15 respective facsimile files. The HTML files are then moved to
an Internet Server at step 104.

    If the first option is not selected, the MSDS 10 next
determines whether the second option has been selected at step
106. With the second option, the facsimile messages are

20 listed along with a reduced size image of the cover page. To
generate this information, the cover page is extracted from
the facsimile file at step 108 and a reduced size HTML image
of the cover page is created at step 110. At step 112, a
listing of the facsimile messages is generated with a

25 thumbnail view of each cover page linked to its respective
facsimile file. The generated HTML files are then sent to the
Internet Server at step 104.

When the third option is selected, as determined at step
114, a full size image of the cover page is sent to the
computer 32. The full size image of the cover page is
generated by first extracting the cover page from the

5   facsimile file at step 116. Next, the cover page is converted
into a full size HTML image at step 118 and, at step 120, the
listing is generated with the embedded cover page linked to
the facsimile file.

If, at step 122, the fourth option is determined to be

10   selected, then a reduced size image of each page is provided
to the user with the option of enlarging the page to view the
contents of the page more clearly. With reference to Fig.
4(B), the information necessary for the third option is
produced by first extracting the first page of the facsimile

15   message at step 124. A reduced size HTML image is created at
step 126 and then a full size HTML image is created at step
128. At step 130, the listing is generated with embedded
thumbnail images of the pages with links to the full size
images. If the page is not the last page, as determined at

20   step 140, then the next page is extracted at step 142 and
steps 126 to 130 are repeated to generate the HTML files for
the other pages of the facsimile message. After the last page
has been converted into an HTML file according to the third
option, the files are moved onto the Internet Server at step

25   104.

At step 144, the MSDS 10 determines whether the fifth
option has been selected. The fifth option provides the user
with a full size image of each page of the facsimile message.

While only five options have been discussed, the invention may

be practiced with additional options. Consequently, with

additional options and with the fourth option not being

selected, the MSDS 10 would next determine whether one of the

5   additional options have been selected. With the preferred

embodiment of the invention having only five options, however,

the MSDS 10 will assume that the fifth option has been

selected if none of the first four options were found to be

selected.

10   The information necessary to display the pages of the

facsimile message according to the fifth option is generated

by first extracting the first page of the facsimile message at

step 146. At step 148, a full size HTML image of the page is

created and, at step 150, a listing is generated with an

15   embedded image and links to previous and next pages. When the

page is not the last page, as determined at step 152, the MSDS

10 extracts the next page and generates the HTML file for that

page. After all pages have been converted into HTML files

according to the fourth option, the files are sent to the

20   Internet Server at step 104.

While Figs. 4(A) and (B) describe the operations of the

MSDS 10 at the time a message is received, Fig. 5 depicts an

overall flowchart of operations for the MSDS 10 when the user

requests a page of information in a display format other than

25   the user's preferred option of displaying the message. Fig. 5

is therefore a more detailed explanation of how the MSDS 10

generates the necessary information at step 82 of Fig. 3.

In general, as shown in Fig. 5, the MSDS 10 first determines the type of image that is needed at step 82a. For example, at this step, the MSDS 10 will determine whether images are unnecessary, whether an image of just the cover

5   page is necessary, whether an image is needed for every page, and whether the image needs to be a full size, a reduced size, or both full and reduced sized images. At step 82b, the MSDS 10 determines whether the image has already been created. If the image has not been created, then at step 82c the MSDS 10

10 will extract the page from the base facsimile file and, at step 82d, generate the required HTML image. As discussed above, the required image may be for just the cover page, for all the pages, and may be a full size and/or a reduced size image of the page. At step 82e, the image is embedded with

15 links or anchors to other HTML files. These links or anchors might be references to the next and previous pages and also to the next and previous facsimile messages. Finally, the HTML file having the embedded image and links is sent to the user at step 80 in Fig. 3.

20   The process for converting a facsimile message into HTML files according to the fifth option will be described with reference to Fig. 6. This process will occur at step 54 when the message is received and when the fifth option is the user's preferred option of displaying the messages. It should

25 be understood that a similar type of process will also occur when the user requests a page of information according to the fifth option when the user is retrieving a facsimile message and the fifth option is not the user's preferred option. The

conversion processes according to the other options will

become apparent to those skilled in the art and will therefore

not be discussed in further detail.

With reference to Fig. 6, when the facsimile message is

5   received, the message is in a Tagged Image File

Format/Facsimile (TIFF/F) and each page of the facsimile

message is split into a separate file. Each page of the

facsimile message is then converted from the TIFF/F format

into a Portable Pixel Map (PPM) format. The PPM files are

10   next converted into separate Graphic Interchange Format (GIF)

files and then into separate HTML files. Thus, each page of

the facsimile message is converted into a separate HTML file.

The TIFF/F files may be converted into PPM with an available

software package entitled "LIBTIFF" and the PPM files may be

15   converted into GIF files with an available software package

found in "Portable Pixel Map Tools."

The invention is not limited to this exact conversion

process or to the particular software packages used in the

conversion process. For instance, the TIFF/F files may be

20   converted into another portable file format, through any other

type of intermediate format, or may be converted directly into

the GIF format. Further, instead of GIF, the facsimile

messages may be converted into JPEG, BMP, PCX, PIF, PNG, or

any other suitable type of file format.

25   The files may be identified with any suitable filename.

In the preferred embodiment, the files for each user are

stored in a separate directory assigned to just that one user

because an entire directory for a given user generally can be

protected easier than the individual files.   The memory,

however, may be organized in other ways with the files for a

single user being stored in different directories.   The first

part of the filename is a number preferably sequentially

5   determined according to the order in which messages arrive for

that user.   The preferred naming convention for ending the

filenames is depicted in Fig. 6.   Each page of the facsimile

message is saved as a separate file with an extension defined

by the format of the file.   Thus, the files will end with an

10   extension of ".TIFF," ".PPM," ".GIF," or ".HTML" according to

the format of the particular file.   In the example shown, the

separate pages have filenames which end with the respective

page number, for instance, the first page ends with a "1."

The files, however, are preferably terminated with a letter or

15   multiples letters to indicate the order of the pages.   For

instance, page 1 might have an ending of "aa," page 2 might

have an ending of "ab," etc.   The invention, however, is not

limited to the disclosed naming convention but encompasses

other conventions that will be apparent to those skilled in

20   the art.

As shown in Fig. 6, in addition to the GIF files

representing the pages of the facsimile message, the HTML

files include a number of anchors or references.   In the

example shown, the first HTML file has an anchor a for the

25   "Next Page."   Anchor a is defined as a = <A HREF = "2.html">

Next Page and will therefore reference the second HTML

file when a user selects the "Next Page."   The second HTML

file has an anchor b for the "Previous Page" and an anchor c.

for the "Next Page" and the third HTML file has an anchor d

for the "Previous Page." With these particular HTML files,

the user can scroll through each page of the facsimile message

and view a full size image of the page.

5   Each HTML file preferably contains anchors in addition to

those relating to "Next Page" and "Previous Page." For

instance, each HTML file may contain an anchor to the next

facsimile message, an anchor to the previous facsimile

message, and an anchor to return to the facsimile list. The

10   HTML files preferably contain anchors relating to "Save" and

"Delete." When the "Save" anchor is selected, the user would

be able to save the message under a more descriptive name for

the message. The "Delete" anchor is preferably followed by a

inquiry as to whether the user is certain that he or she wants

15   to delete the message. Other anchors, such as an anchor to

the general listing, will be apparent to those skilled in the

art and may also be provided.

Fig. 7 provides an example of a display according to the

fifth option for the first page of the facsimile message shown

20   in Fig. 6. The headings of the display provide information on

the telephone number from where the message was sent, the date

and time the message was received at the MSDS 10, and an

indication of the page of the message being displayed. The

main portion of the display is the full size image of the

25   page. At the bottom of the display, an anchor or link is

provided to the "Next Page" and another anchor is provided to

the "Return to Fax Listing." Additional information may also

CLAIMS

I claim:

1   1.   A network message storage and delivery system,

2   comprising:

3   means for receiving an incoming call and for

4   detecting an address signal associated with said incoming

5   call, said address signal associated with a user of said

6   message storage and delivery system;

7   means for receiving a message accompanied with said

8   address signal, said message being in a first file

9   format;

10   means for converting said message from said first

11   file format to a second file format;

12   means for storing said message in said second file

13   format in a storage area;

14   means for receiving a request from said user for

15   said message and for retrieving said message from said

16   storage area; and

17   means for transmitting at least a portion of said

18   message in said second file format to said user;

19   wherein said portion of said message is transmitted

20   to said user over the network and said second file format

21   is a mixed media page layout language.

1   2.   The message storage and delivery system as set

2   forth in claim 1, wherein said network comprises the

3-   Internet.

1   3.   The message storage and delivery system as set

2   forth in claim 1, further comprising means for notifying

3   said user of said message.

1   4.   The message storage and delivery system as set

2   forth in claim 3, wherein said notifying means comprises

3   means for sending an E-mail message to said user.

1   5.   The message storage and delivery system as set

2   forth in claim 3, wherein said notifying means provides

3   said user with information on a type of said message.

1   6.   The message storage and delivery system as set

2   forth in claim 3, wherein said notifying means comprises

3   means for paging said user.

1   7.   The message storage and delivery system as set

2   forth in claim 6, wherein said paging means comprises an

3   alphanumeric pager.

1   8.   The message storage and delivery system as set

2   forth in claim 1, wherein said message comprises a

3   facsimile message.

1   9.   The message storage and delivery system as set

2   forth in claim 1, wherein said message comprises a data

3   message.

1   10.   The message storage and delivery system as set

2   forth in claim 1, wherein said message comprises a voice

3   message.

1   11.   The message storage and delivery system as set

2   forth in claim 1, wherein said means for receiving said

3   incoming call receives said incoming call over a DID

4   trunk.

1   12.   The message storage and delivery system as set

2   forth in claim 11, wherein said means for receiving said

3   incoming call receives incoming calls over a plurality of

4   DID trunks.

1   13.   The message storage and delivery system as set

2   forth in claim 1, wherein said means for receiving said

3   message detects whether said message comprises any one of

4   a facsimile message, a data message, or a voice message.

1   14.   The message storage and delivery system as set

2   forth in claim 1, wherein said second file format

3   comprises a standard generalized mark-up language.

1   15.   The message storage and delivery system as set

2   forth in claim 14, wherein said standard generalized

3   mark-up language comprises hyper-text mark-up language.

1   16.   The message storage and delivery system as set

2   forth in claim 1, wherein said means for receiving said

3   request from said user comprises a hyper-text protocol

4   deamon for receiving said request over the Internet.

1   17.   The message storage and delivery system as set

2   forth in claim 1, wherein said message comprises a

3   facsimile message, said first file format comprises

4   TIFF/F, said second file format comprises HTML, and said

5   converting means embeds a reduced size image of at least

6   one page of said facsimile message within said second

7   file format.

1   18.   The message storage and delivery system as set

2   forth in claim 17, wherein said reduced size image of

3   said one page is provided as an anchor to a full size

4   view of said one page.

1   19.   The message storage and delivery system as set

2   forth in claim 1, wherein said message comprises a

3   facsimile message, said first file format comprises

4   TIFF/F, said second file format comprises HTML, and said

5   converting means embeds a full size image of at least one

6   page of said facsimile message within said second file

7   format.

_ _

1   20.   The message storage and delivery system as set

2   forth in claim 1, wherein said message comprises a

3   facsimile message, said first file format comprises

4   TIFF/F, said second file format comprises HTML, and said

5   converting means generates a listing of all facsimile

6   messages associated with said user.

1   21.   The message storage and delivery system as set

2   forth in claim 1, wherein said message comprises a

3   facsimile message and said system further comprises

4   previewing means for sending said user a listing of all

5   facsimile messages for said user along with a reduced

6   size image of a first page for each facsimile message.

1   22.   The message storage and delivery system as set

2   forth in claim 21, wherein each reduced size image of the

3   first page comprises an anchor and said transmitting

4   means transmits the facsimile message associated with

5   said anchor to said user when said user selects said anchor.

1   23.   The message storage and delivery system as set

2   forth in claim 1, wherein said message comprises a

3   facsimile message and said system further comprises

4   previewing means for sending said user a listing of all

5   facsimile messages for said user along with a full size

6   image of a first page of each facsimile message.

1   24.   The message storage and delivery system as set

2   forth in claim 1, wherein said message comprises a

3   facsimile message and said system further comprises

4   previewing means for sending said user a reduced size

5   image of each page of said facsimile message.

1   25.   The message storage and delivery system as set

2   forth in claim 24, wherein each reduced size image

3   comprises an anchor to a full size image of the

4   respective page.

1   26.   The message storage and delivery system as set

2   forth in claim 1, wherein said message comprises a

3   facsimile message and said system further comprises

4   previewing means for sending said user a full size image

5   of each page of said facsimile message.

1   27.   The message storage and delivery system as set

2   forth in claim 1, wherein said means for receiving said

3   incoming call comprises a central processor and said

4   means for receiving said request from said user comprises

5   a network server.

1   28.   The message storage and delivery system as set

2   forth in claim 1, wherein said message comprises a

3   facsimile message and said second file format comprises a

4   grey scale image of said facsimile message.

1   29.   The message storage and delivery system as set

2   forth in claim 28, wherein said image of said facsimile

3   message comprises a full size image of said facsimile

4   message.

1   30.   The message storage and delivery system as set

2   forth in claim 28, wherein said image of said facsimile

3   message comprises a reduced size image of said facsimile

4   message.

1   31.   The message storage and delivery system as set

2   forth in claim 1, wherein said message comprises an audio

3   message and said transmitting means transmits all of said

4   message to said user, said system further comprising

5   means for playing said audio message in real time as said

6   message is received by said user.

1   32.   A network message storage and delivery system,

2   comprising:

3   a central processor for receiving an incoming call,

4   for detecting an address signal on said incoming call,

5   for detecting a message on said incoming call, and for

6   placing said message in a storage area, said address

7   signal being associated with a user of said network

8   message storage and delivery system;

9   a network server for receiving said message from

10   said storage area, for converting said message into a

11   mixed media page layout language, and for placing said

12   message in said storage area;

13   wherein when said network server receives a request

14   from said user over said network, said network server

15   transmits at least a portion of said message over said

16   network to said user.

1   33.   The network message storage and delivery system

2   as set forth in claim 32, wherein said network comprises

3   the Internet and said network server comprises an

4   Internet server.

1   34.   The message storage and delivery system as set

2   forth in claim 32, wherein said central processor

3   comprises a pulse/tone decoder for detecting said address

4   signal and a digital signal processor for detecting said

5   message.

1   35.   The message storage and delivery system as set

2   forth in claim 32, wherein said network server comprises

3   a hyper-text transfer protocol deamon for receiving said

4   request from said user.

1   36.   The message storage and delivery system as set

2   forth in claim 32, wherein said network server sends said

3   user an E-mail message after said message has been

4   received by said central processor.

1   37.   The message storage and delivery system as set

2   forth in claim 32, wherein said network server is

3   connected to a paging system for paging said user after

4   said message has been received by said central processor.

1   38.   The message storage and delivery system as set

2   forth in claim 32, wherein said central processor is

3   connected to a DID trunk and said incoming call is

4   received over said DID trunk.

1   39.   The message storage and delivery system as set

2   forth in claim 32, wherein said central processor is

3   connected to a plurality of DID trunks and said incoming

4   call is received over one of said DID trunks.

1   40.   The message storage and delivery system as set

2   forth in claim 32, wherein message comprises a facsimile

3   message and said network server converts said facsimile

4   message from TIFF/F into a hyper-text mark-up language

5   file.

1   41.   The message storage and delivery system as set

2   forth in claim 32, wherein message comprises a data

3   message and said network server converts said data

4   message into a hyper-text mark-up language file.

1   42.   The message storage and delivery system as set

2   forth in claim 32, wherein message comprises a voice

3   message and said network server converts said voice

4   message into a hyper-text mark-up language file.

1   43.   The message storage and delivery system as set

2   forth in claim 32, wherein said message comprises a

3   facsimile message and said network server generates a

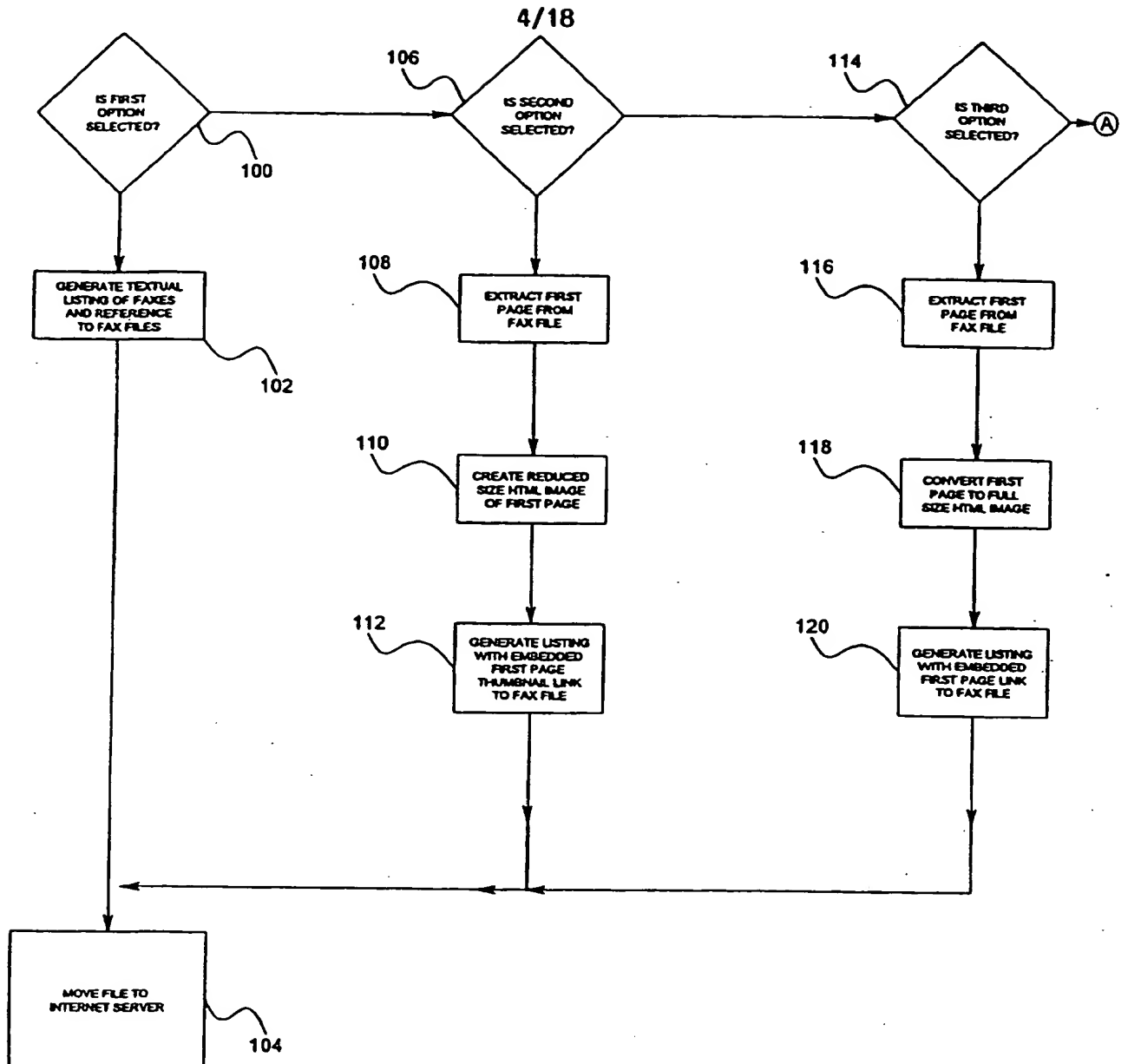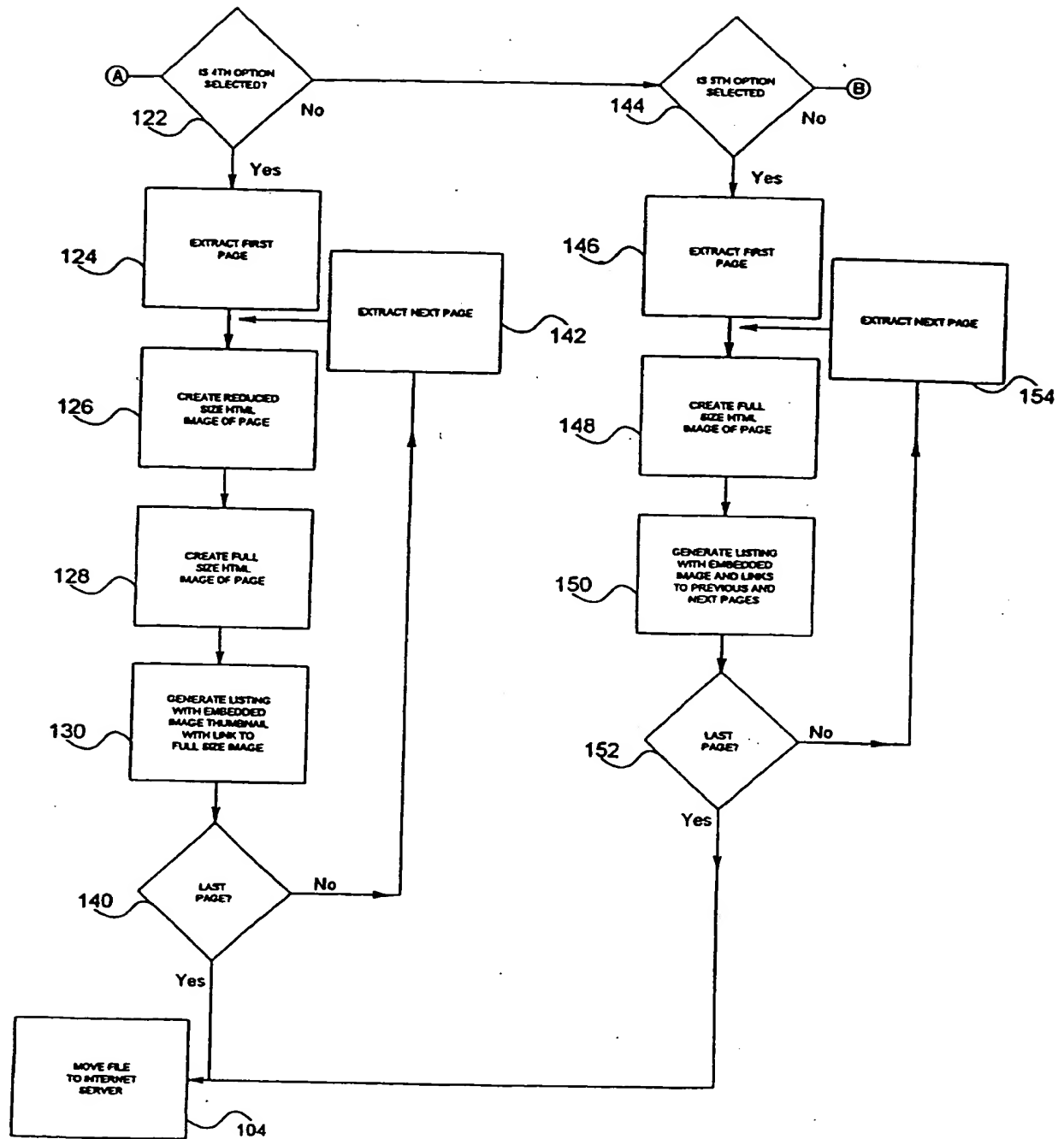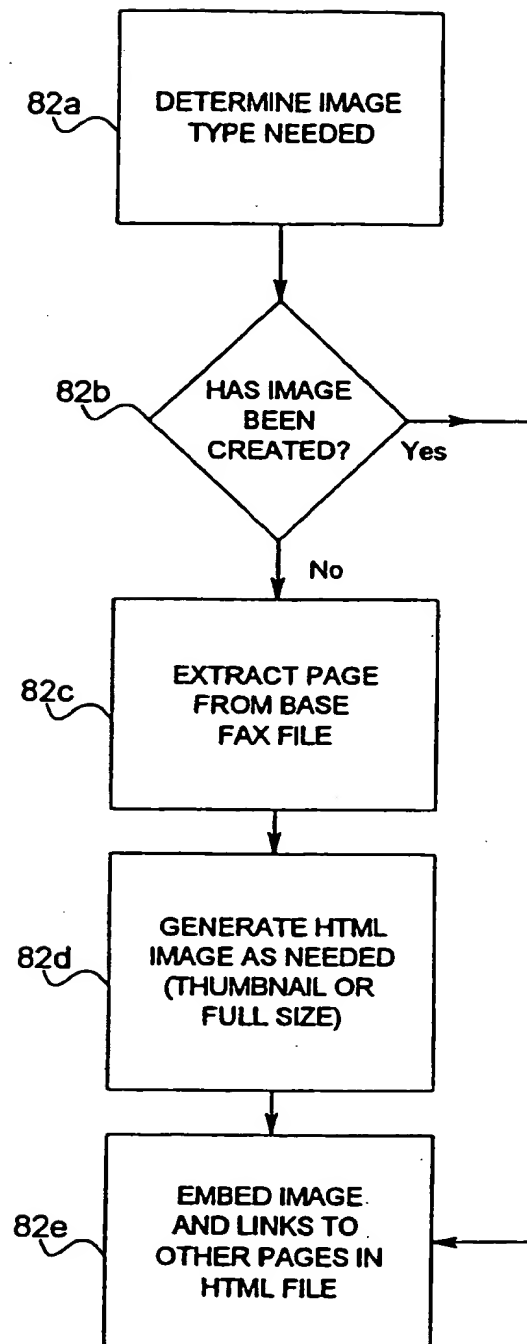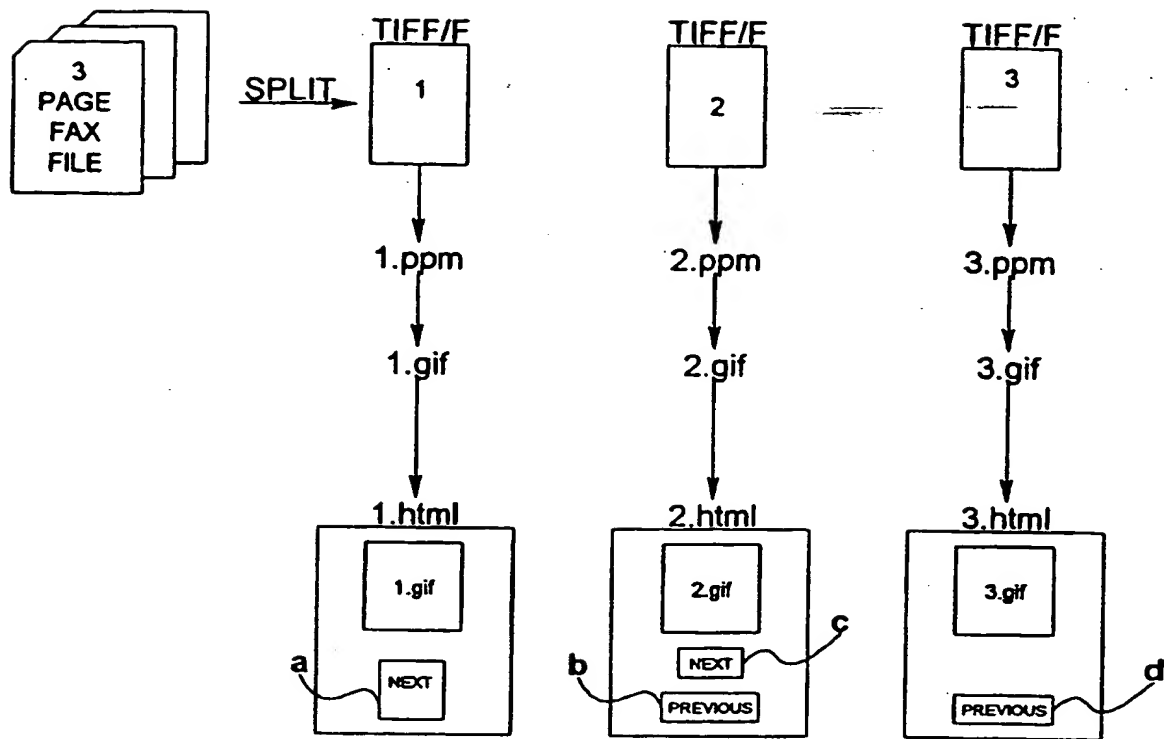4   grey scale image of said facsimile message.

FIG. 4(A)

FIG. 4(B)

82a — DETERMINE IMAGE TYPE NEEDED

82b — HAS IMAGE BEEN CREATED?   Yes

No

82c — EXTRACT PAGE FROM BASE FAX FILE

82d — GENERATE HTML IMAGE AS NEEDED (THUMBNAIL OR FULL SIZE)

82e — EMBED IMAGE AND LINKS TO OTHER PAGES IN HTML FILE

FIG. 5

FIG. 6